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inal illustration is here again suggestive. The structural principle of the many areas is a principle to which each of them must conform. Figuratively speaking, it sets a limit beyond which they can not go. But it produces no single area, although an infinity of areas is producible. As over against them structure is absolutely inert. And this seems true generally. Structure is the inert principle of all existence. On this fact itself I do not now dwell, although the derivatives of it are interesting and illuminating. I wish rather to venture one further generalization, namely, the identification of structure with matter when matter is metaphysically conceived. When so conceived—and here again we seem forced into paradoxical statements—when so conceived, matter loses its material qualities. These qualities, like solidity, fluidity, *etc.*, as well as all the so-called secondary qualities, have long appeared to men as convertible into one another and to afford no absolute basis for exact determination. Even the conception of chemical elements is seriously attacked on both theoretical and experimental grounds. But the conception of structure remains intact and to this conception still cling the so-called primary qualities of matter like inertia and those which are only quantitatively and relationally expressible, like weight. If the materials of things are convertible, it seems evident that in no sense can any one of them be more final and primary than any other; but if all are convertible in terms of changeless structural principles, these latter would appear to give us just that absolute conception of an inert factor in existence which has long borne the name of matter. This proposed identification of structure with substance and with matter is here only suggested. I hope at another time to elaborate it.

Indeed the points put forward in this paper are all in need of elaboration. But it has occurred to me that they might prove suggestive as indicating a field of metaphysical inquiry apparently free from the controversial questions of much recent philosophy. The considerations here suggested seem to me to afford scope for inquiry and discussion independent of mooted questions about the truth of perception or the possibility of knowledge.

FREDERICK J. E. WOODBRIDGE.

COLUMBIA UNIVERSITY.

THE FIRST ANTINOMY OF KANT

THE thesis of Kant's first antinomy is unsound because in the course of the proof a hypothesis is implied which contradicts the orignal hypothesis. The passage in the Meiklejohn translation runs as follows:

THESIS

"The world has a beginning in time.

PROOF

"Granted, that the world has no beginning in time; up to every given moment of time, an eternity must have elapsed, and therewith passed away an infinite series of successive conditions or states of things in the world. Now the infinity of a series consists in the fact that it never can be completed by means of a successive synthesis. It follows that an infinite series already elapsed is impossible, and that consequently a beginning of the world is a necessary condition of its existence. And this was the first thing to be proved."

The proof may be paraphrased as follows:

THESIS

The world has a beginning in time.

(1) Suppose the contrary, that is, that the world has no beginning in time.

(2) Then an infinite number of hours must have elapsed up to the present.

(3) But time, up to the present, is completed, and (4) no infinite series can be completed.

Leaving the paraphrase, (4) is false unless we suppose that the infinite series *has a beginning,* which contradicts the hypothesis (1).

Let us illustrate the point. If an infinite series has a first term and each term has a definite successor, there can be no last term; for example, the infinite series

$$0, 1, 2, 3, \ldots,$$

beginning with zero, can have no last term.

But an infinite series may have a last term provided it has no first term, for example, the series

$$\ldots 3, 2, 1, 0,$$

ending with zero, but having no first term, is infinite.

Therefore, to say that a series is not infinite because it has a last term is to say that it has a first term; for example, the series

$$3, 2, 1, 0,$$

which has a last term zero, is not infinite because it has a first term, 3.

But it is this hypothesis (that the time series has a first term) which Kant explicitly rejects at the outset of his proof. His fallacy is of the following familiar type. To prove that on a clear day it rains.

Proof. (1) It either rains or it doesn't.
(2) It doesn't; throw out that case.
(3) Therefore, it rains.

Apparently, the only alternative for one who wishes to defend Kant's position is that the mathematical notion of an infinite sequence is self-contradictory. Readers of this JOURNAL will find the notion set forth in detail in an article "On the Notion of Infinity," August, 1915. If the mathematical position is sound, then Kant's position is unsound and *vice versa.* Kant himself confuses the *infinite,* which he pretends to respect, and the *indefinite,* for which he has no regard. Kant's indefinite is the mathematical infinite, and what Kant's infinite is I am unable to make out. For me it is without meaning.

CHARLES W. COBB.

AMHERST COLLEGE.

SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on Monday, April 23, at Columbia University. The following papers were read and discussed:

The Speed and Accuracy of Motor Adjustment.—JOHN J. B. MORGAN.

An experiment in which the subjects were instructed to pull with their maximum force weights attached to a rope showed, from the graphic records obtained of each pull, that when the size of the weights is unexpectedly changed the subject adjusts himself by a change in force rather than a change in the speed of his pulls. The time required to make this adjustment is less than $\frac{1}{20}$ of a second (much less than the simple reaction time) and hence must be a reflex or a local muscular phenomenon.

In another experiment where the subjects were instructed to pull four different weights with the same force, and were allowed before pulling a new weight to make trial lifts, it was found that the *force* was much more radically changed with the different weights than the *time.*

These two experiments show that the force an individual uses varies either by a reflex or local muscular adjustment with the resistance encountered; and that with the extent of a movement re-